HYPNOSIS, ITS PSYCHOLOGICAL INTERPRETATION AND ITS PRACTICAL USE IN THE DIAGNOSIS AND TREATMENT OF DISEASE *

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I SHALL endeavor to demonstrate and interpret to you to-day hypnosis as we have been employing it for the purpose of diagnosis and therapy at the Vanderbilt Clinic during the last year and a half, and shall show you a series of patients who have been treated in this way. It may interest you to know that this is the first clinic on hypnosis held at this university except for one by Dr. Starr in 1892, and that old as psychotherapy is in practice—older by far than all other therapy—it has rarely been taught at the colleges, and you are probably among the first to receive instruction in the subject. This is far from saying, however, that we have been timely in engaging in this work, or are as yet by any means sufficiently energetic in treating it as a subject *per se*, or in launching it as a propaganda in defiance of the false "isms" and "ologies" ripening in our land. Abroad the work has been carried forward since the middle of the Nineteenth Century, or even before, and schools and traditions in psychotherapy have grown up and are to-day walking abreast with other therapeutic endeavors.

In no other branch of our science do we lag so far behind the continental schools as in this, and in none are we so in need of sane and rational leverage as here, for our people are among the most gullible (and hysterical) in the world and are easily led

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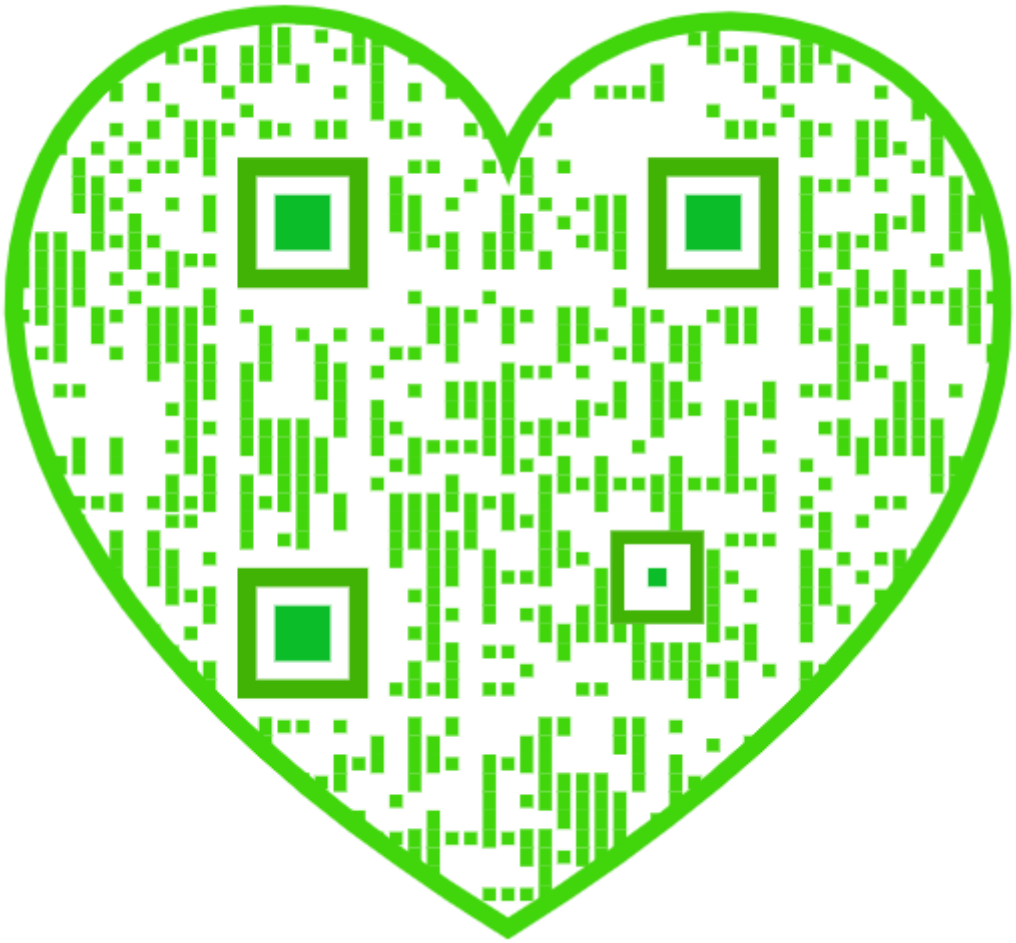

into strange and absurd beliefs by anything novel and specious, especially if their intelligence be flattered, or the proposed adjuvant be coated with theological veneer.[1] And so it has come about that we have in large measure forgotten actual scientific reasoning, and have allowed metaphysical pseudo-science and religio-metaphysical doctrines to sprout until they have become a power and

[1] Let me refer to Christian Science (and the vaguer immitations sometimes spoken of as New Thought, etc.) and Emmanuelism, movements which have made incredible strides within a few years and have flooded us with a prodigious literature. In spite of the grain of truth they may contain, they must be condemned from our point of view as being utterly unscientific, irrational and dangerous. Then there is Dowieism! It is scarcely conceivable that in the light of the Twentieth Century an imposter setting himself up as a second Elijah should be heralded as such by some quarter of a million people and receive their wealth and allegiance. Schlatter, though quite a different type of man, was just beginning to have a following when he starved in the desert. With us also lies the credit of having given birth to spiritualism and of fostering its growth. When in 1844 Davis (the "Poughkeepsie Seer") proclsimed that he was visited in a trance by the spirits of Galen and Swedenborg and had great things to divulge to the world, and in 1848 it was proclaimed that the Fox sisters (of Hydesville, N. Y.) had established communication with the dead, these startling phenomena were taken up quite seriously everywhere, so that very soon supernatural "knocking" was heard throughout the country, and it is recorded that only a year or two after (about 1850) there were some hundred or more individuals in New York itself claiming mediumistic powers and nearly as many more in the neighborhood. And the knocking and table-tipping infection has constantly spread until, alas, it even entered high circles. Let me also recall to you the famous Madam Blavatsky and the founding of the Theosophical Society in New York in the seventies. The preposterous story of the Brotherhood of "Mahatmas" in Tibet and the transcendent and miraculous powers of this fraternity was accepted by thousands. Then the imposture of its founder was definitely proved—but theosophy just kept on and is supposed at present to have a very large following. At Loms in California there is an immense theosophical school and you have all heard of its "purple mother"! It is not entirely impossible that at some ripe moment there may be a swarming of its young disciples, and theosophy be the next religious fad forced upon us. Here, too, in reference to our hysterical emotionalism, I may allude to our mania for "revivalism" and prayer-meeting epidemics (no other country on the globe has just this sort of thing. For an interesting account see the chapter "American Mental Epidemics" in Sidis's "The Psychology of Suggestion"), our exaggerated athletic spirit, which has apotheosized baseball and football and crowded the academic from our schools (see Professor Gayley's "Idols of Education" a book it would do every American educator and student good to read), our Trilby, Klondike, prize-fight crazes and those delightful asininities, the Billiken and the Teddy Bear, the latter having certainly gone beyond the bounds of a fad with us.

a menace among us. The medical profession itself is much to blame for this, for it has partly countenanced the work of the "healers," saying for instance, that "science," etc., is good for functional diseases or neurotic individuals, forgetting that such cults belie real science and set at naught all that Biology, Bacteriology, Pathology, etc., have taught us, while on the other hand (with a few individual exceptions) it has ignored psychology and psychological medicine,[2] and has looked upon the study of mental influence as dominant over the body, of "fantasy as a worker of wonders," as unorthodox and unworthy of professional inquiry. And even to-day, in spite of the work and fame of the School of Nancy and its distinguished disciples (Liebault, Bernheim, Forel, Wetterstrand, Vogt, Moll, Jong, Voisin, Berillon, etc.) besides that of such other European workers in the field of pathological psychology as Ribot, Richet, Binet, Pierre Janet, Schrenck-Notzing, Krafft-Ebing, Ziehen, Bechterew, etc. (the list of names is far too long to give it completely), and in our own country especially Prince, Putnam, and Sidis, that important branch of psychotherapy which we are discussing to-day,—eminently important aside from its own value because out of it grew the study and practice of psychotherapy as we know it to-day and through it was opened the study of psychopathology which has enabled Science to take new and promising surveys in what had hitherto been unfertile and unpropitious fields of work,—is either looked at with sinister connotation by the profession and referred to as a discreditable or even dangerous procedure, or, at the other extreme held to be so much nonsense and quackery.

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[2] Since this clinic was held Professor Schurman of Cornell University in an address on the relation of the University to the Medical School said among other things in speaking of the studies he would prescribe for the prospective medical student, "To these I would add a subject which I never see mentioned by advocates of either of the extreme positions I have already described, I mean the important subject of the study of the mind and more particularly those aspects of it which are embraced in the modern science of experimental psychology. Considering the close relation between mind and body and the dependence of some diseases upon mental conditions, I am often amazed that medical men fail so completely to realize the importance of the study of the sciences of mind as a part of the curriculum of the preliminary education they lay down for the student of medicine." (Jour. Am. Med. Assoc., April 16, 1910.)

Let me turn to our cases and you may judge for yourself from what you shall see. Before proceeding further I shall put several patients into hypnotic sleep so that you may observe the condition induced before you. This may not be as spectacular as you may have been led to expect, but purposing in our work as conservatively as possible we have omitted all theatrical display and unnecessary effect, striving only to cure our patients or mitigate those symptoms for which they have sought our aid.

You will notice that I have used various methods, there mere fascination of the eye, as it is termed, here having the patient gaze into a crystal sphere (Braid's method), here using verbal suggestion, here command, here by stroking with my hands, here using several methods combined. It does not matter what method we use as long as we attain the condition itself. Nor does it matter how deeply the patient sleeps, so long as he does not fall into real sleep,[3] in which state mental communication between his mind and mine ceases, or as is said, we are no longer *en rapport.*

Now what is the condition in which you see these patients? What is hypnosis? I shall try to give you some insight into this romantic realm of the mental by paralleling analogies from the normal waking state with its phenomena, and elucidating both by means of psychological interpretation. I shall not be able to satisfy you entirely, for on this subject we are in most respects as ignorant as upon that of sleep itself.[4] To be sure, many theories have been advanced in explanation, psychological, physiological, histological (Heidenhain, Charcot, Liebault and Bernheim, Vogt and Forel, Dessior, Wundt, Cappie, Culerre, Papin, Grasset, Lipps, etc.), none of which, however, has proved satis-

[3] As to depth of hypnosis many gradations have been made (Charcot 3, Liebault 6, Bernheim 9, Forel again 3, Krafft-Ebing, Moll, Hirschlaff, etc. 2). For our purpose we may speak of superficial and deep real hypnosis and a hypnoid condition often autosuggested. For therapeutic purposes the first condition is sufficient, while good results are often obtainable even in the last.

[4] So the various authors are also at odds as to whether hypnosis is real sleep or allied to sleep, or an entirely dissimilar state. That it is in no sense like sleep is the opinion of Kraff-Ebing, Mendel, Döllken, M. Hirsch, Hirschlaff, etc. That it is similar to sleep is held by Liebault, Bernheim, Vogt, Forel, Lehman, Wundt, etc. That deep hypnosis is real sleep but the milder forms are not is held by Kraepelin, Delbœuf, Moll, etc. I myself am of the first opinion. See Chapter V, Moll, "Der Hypnotismus," Berlin, 1907

factory. And yet these endeavors to explain, especially by analogous phenomena in the normal waking and sleeping states, have done much to make hypnosis psychologically intelligible and to divest it of its mysticism and the hypnotist of supposed occult and supernatural power. We know now that the phenomenon rests with the subject, not with the experimenter (a fact claimed by the Abbé Faria as early as 1814), and that its secret is based upon suggestion.

Let us say tentatively that we have in hypnosis a changed psychic condition in which a relative or absolute *dissociation* has been brought about by *suggestion*. Of course this must be effectual suggestion. And upon the ability of making suggestion effective, or, in better words, of achieving the acceptance of suggestion, lies the talent of the psychotherapist and the might of hypnotism. This, as already said, does not necessitate any supernatural endowment, though it does certain qualities of personality, as for instance, aptitude for coercion, and possibly that cogent something which on the one hand spells the imperative behind all persuasion and on the other motivates the allaying of fear, the easing of distress, the leveling out of life's demures into faith and hope. This something works in our hands by insight into human nature and with knowledge of the mind's associative dynamics. For behind suggestion stands the law of association.

And yet this does not explain all on the subject's side, for even in the normal waking state we have our inexplicable subjugations, we know how certain individuals sway others, how great statesmen, scholars, and scientists have been dominated by inferior individuals, a fact often incredible to us, how we ourselves are constantly being swayed knowingly or unknowingly and, if challenged for the cause, could give no reason why. Upon this fact Moll bases his third attribute among the five which he draws up as characteristics of our soul life, namely (I quote only the first four, as the fifth does not concern us here) (1) That man has naturally a certain inclination toward being influenced by others, and toward believing much without consciously coming to logical deductions; (2) that when one believes or expects a thing there results a tendency for the corresponding psychological and physio-

logical process to set in;[5] (3) that we not only have an innate inclination toward being influenced by others, but a proneness to being influenced by *certain* others; (4) that such influence is the greater having once been demonstrated—or again, that having once been influenced, the tendency of being influenced by the same individual becomes stronger. Without going into deeper analysis of these psychological facts, let us instance their truth by citing occurrences from everyday life: Let some one yawn and we yawn. Let some one at an assembly cough, and soon many are coughing. Let some one look up into the air and every one follows suit. See others drinking and you too grow thirsty (you know the popular phrase "making the mouth water"). See a faucet running and you soon feel the desire to urinate (a little trick many physicians make use of in their daily practice). How often does one feel an itching after having seen one of the tribe of pediculi, or bed-bugs,—"imagines he has caught it"! The very thought of it may cause itching. Close your eyes and sleep may supervene. Children smile if we smile, or may cry if we look askance. How easily they get a headache if they hear their elders speaking of one. In fact nervous parents invariably psychically infect their children. Again, you see the flag and you are stirred with a feeling of patriotism. A folk song or a picture may induce nostalgia. Sadness or gladness may overcome you on the suggestion of sadness or gladness in a person, play, or book. Finally, let several people tell a man he looks ill, and by and by he begins to feel so.

To bring the second attribute into consideration: The dyspeptic thinking he will have a pain after his meal, soon has it. The stutterer fearing to stutter does so. Those who are annoyed by inopportune blushing or flushing find themselves flushing as soon

[5] The importance of this cannot be overestimated in psychotherapeutic work. To produce the conviction of the desired effect, no matter whether this is done in the waking or hypnotic state, is really the "open sesame" to our success. Dubois in his crisp and sturdy way has said, "The neurotic finds himself on the road to recovery directly he has the conviction of being cured; he is to be considered cured the moment he himself believes it" (Les Psychoneuroses, etc., Leçon xvii, p. 245). He adds, "this is the thought the physician must bear in mind if he wishes to heal his patient. But it is not sufficient to take this skeptically. He (the physician) must himself be convinced and must be capable of psychically infecting his patient with the same conviction."

as they are afraid (and ashamed) that this may occur. A mother fearing her infant may wake up and cry, believes every moment she hears the crying. Let one anxiously awaiting someone's return, strain his ear in the silence of the night, and he will every few moments imagine he is hearing footsteps. The false sense-perception is corrected again and again, and yet again does he imagine he hears the sound. The apprehensive "look-out" in the fog easily sees outlines of ships before him, and the eager explorer in the ice of the north constantly sees illusive lands on the horizon. I remember a hazing act at a certain society where a man after being blindfolded was told he had to give up a little blood for the human ink used in keeping the secret records. His arm was cleansed and he was then made to believe that a minute incision was being made (this was done with a sharp cold lead pencil), that unfortunately the cut had injured a vessel, that the bleeding could not easily be stopped, etc. At the same time water was dripped into a basin, drop by drop as if blood were flowing. Then someone said in a scared way, "better call a doctor quickly, that's unfortunate,"—and the blindfolded initiate fell over in a dead faint. Through suggestion he has been made to become pale, have cold, clammy hands, have an interrupted heart action, brain anæmia and the resultant syncopal attack. Boerhaave relates a similar story, that a man condemned to death was handed over to him; that having blindfolded him, he went through the pretence of opening his veins (much as in the above hazing act) and that when the bandage was later removed he found the man dead. Give a patient a placebo and have him think it is a narcotic, and he sleeps. The thought of having taken the wrong medicine or a poison by mistake has frequently caused collapse; and you know how surgical patients have died in collapse from fear before the operation was begun. This "expectant attention" is the cause of many neurasthenic and hysterical symptoms (it is the cardinal element in the sexual-neurasthenic) and of many illusions and hallucinations (as noted above). It explains the apparitions in many a ghost story, by the way, and is a prominent factor in not a few of the famous imaginative tales of Poe, Hoffmann, Pushkin, Turgenev, Gautier and Maupassant.

Finally to take up the third attribute (and with it the fourth).

you all know how the mere presence of certain physicians helps or cures a patient (they feel better "as soon as they enter the office"), this especially so if it has happened before; how certain great men, leaders without, have at home been "under the boot" of their housekeepers or inferior wives; how certain teachers have greater power over pupils, certain lecturers almost a fascinating influence over students (Plato, Newman, Pater,—and as a recent example, Professor G. E. Woodbery); how certain clergymen can stir more intensely than others; how weak-brained individuals have been great politicians and leaders of men, or again a Joan of Arc an inspiration to valor, a Napoleon among generals electrifying an army. Again, friendship or love for certain individuals makes us wish to serve them, and lets us discern qualities, virtues or beauties, where they often enough do not exist.[6] In fact love, or even mere sexual attachment, easily enthralls. The sexual influence is astonishingly powerful and its peculiar puissance has eluded all analysis. You all know the part mistresses have played in the lives of Kings and the histories of countries,—and no less in the drama of private lives. This sexual attraction has been the chief theme of great operas, poems, novels, etc. It has become the *Leitmotiv* because of the tragedy involved, the dark peremptories the Fates here spin. (Let me refer to Prevost's "Manon Lescault," Dumas' (fils) "Camille" and "The Clemenceau Case," D'Annunzio's "Triumph of Death," George Sand's "Leone Leoni," the Countesse de Martel's (Gyp) "The Fairy," Strinberg's "Fräulein Julia," Kleist's "Kätchen von Heilbronn," Wagner's "Tristan und Isolde," France's "Thaïs," etc.) Krafft-Ebing[7] also alludes to this and points out how the will in such cases may be so under the influence of another as to make this problem of the greatest criminopsychological interest. He named this condition *Geschlechtschörigkeit* (sexual servility). A person under such influence may be induced to do the greatest criminal act at the mere bidding. (You all know the story of Mérimée's "Carmen.") Here too we might place the entire chapter of Masochism (although this

[6] Schopenhauer interprets this condition differently by assuming that the "interest of the species" blinds the personal interest. (See essay on the Metaphysics of Love.) This theory is psychologically untenable.

[7] Psychopathia Sexualis, pp. 151 and 396.

of course belongs entirely to the pathological). In all these sexual instances we cannot explain the influence of the one individual over the other. Mythology and mediæval tale have taken this into account, and the power of demons and gods, of love-philters, amulets, aphrodisial draughts and animal magnetism have all been drawn upon to explain it, nor must we forget the "elective" theory of Goethe's novel "Die Wahlverwandschaften." Again, special individual influence is wielded under such guise as we have learned to know as authoritative, as influential with heaven, or with the spirits or with strange natural phenomena, *e.g.*, of anyone having attained position, of the clergy, monks and nuns, of gypsies, soothsayers, of hunchbacks (see the many historic and literary instances in the novels of Scott and Dickens, and several instances in Shakespeare), and finally of so-called mesmerists and hypnotists, the presumed unlimited power of the latter being especially due to stage exhibitions.

Let me sum up the truth of the foregoing analogies by saying that suggestibility or "credivity," as Bernheim has called this human proneness to idea-influence, is a fundamental characteristic of our normal mental life, that it is common to all of us without exception,[8] that credulity and expectation, the tendency to believe much without making conscious logical deductions, are normal psychological phenomena, which give the clue to the exteriorizing and actualizing of imagination and the development of suggestibility.[9] Then, too, the degree to which we are susceptibly suggestible varies, depending upon person and place, upon momentary mood, mental state, and the associations evoked. Fatigue, perturbation, passion, intoxicants, and especially passive emotion enhance our impressionability and strongly reinforce our susceptibility to suggestion, viz., the twilight, the dark, the reminiscent

[8] Bernheim pointed out, and Forel also states, that the refractory cases only appeared to be so, were so in fact only for the time being, and depended upon momentary conditions ("psychological relationship" between the subject and operator at the time being). Forel believes that probably all healthy individuals are hypnotizable, and Vogt goes so far as to say that not only are all healthy individuals hypnotizable, but somnambulizable—that is it is possible to put them into deep hypnosis.

[9] So Carlyle also wrote, "not our logical, measurative faculty, but our imaginative one is King over us," etc. (Sartor Resartus.)

mood, perfumes and music, silence and the evanescent environs of dream-states. In short, life does not dabble in realities alone—we are truly such stuff as dreams are made of—and every moment we are here in time is our consciousness swayed and modulated by the mingled real and mirage reflection of environment and idea.

This brings us to a closer scrutiny of *suggestion* itself, and in gauging it psychologically we come to clearer understanding of its action in connection with hypnosis. Much thought has been used up on this word and many have tried to define it. The conception is extremely subtle and elusive. If I submit an idea to the mind, or if our sense organs send up impressions and the mind accepts them, this is akin to conviction, but not suggestion. A suggestion is really not the idea but an intimation of the idea. It becomes an idea if accepted in consciousness. I might say that in suggesting I place the "pictorial" of an idea before the mind, and the suggestion works inasmuch as consciousness proceeds in actualizing this as if it were an idea, in reacting as if what is only a "ghost" of the actual were in fact real. For example, if I place two electrodes to your body and say that now you feel a weak current, and if I really let some current go through and you do perceive it, this has not been suggestion. But if I say the current is now passing and you believe you feel it in spite of the fact that I am not letting any current pass, then I have *suggested* the current to you.[10] The suggestion has entered your mind, your mind took for actual what was not actual. Or I might say your imagination "exteriorized" the consciousness of the sensation of electricity, making real what was only mental. It was Lipps who in his fine analytical way pointed out that the psychological phenomenon, the psychophysical activity occurring in suggestion must rest upon acceptance of ideas under "inadequate conditions" and not upon logical deduction. In other words, adequate means to the production of conviction might be grounds or reasons for so believing, while the suggested production of conviction would have such

[10] This experiment was undertaken by L. Schnyder, who found that over two-thirds of those tested perceived sensations, attributed to the electric current. See l'examen de la suggestibilité chez les nerveux. Arch. de psych. No. 12. 1904. Cited by Dubois.

grounds or reasons wanting. For example, if I told some one that I just heard through a third party that during his absence his house had taken fire, my words would produce real, motor, and emotive ideas in his mind. But this would contain no element of suggestion, for he would believe with full conviction, knowing how possible such an occurrence is, and not having any cause to discredit my words. But, if sitting in his own room, I should tell him the room was full of smoke and he believed it (as he would under hypnosis) this would be the acceptance of an idea under inadequate conditions, without ground or reason. We may therefore now formulate our definition of suggestion as a phenomenon in which under inadequate provision certain sense-perceptions are created or ideas generated, and the motor consequence precipitated by awaking the consciousness of the actual entrance of such contents in the stream of consciousness. We have already said that this occurs often enough in daily life, that we are constantly believing things without first logically reasoning them out. Nor do I again need to cite analogies from normal mental activity to substantiate this first of the five "characteristics" alluded to above, though it might be well to reiterate here that there is no one who believes only what he has deduced from logical reasoning. In this connection Moll has said, that were we to go through such weighing and surveying of every sense-perception as it presents itself to consciousness, we would be eternally at this and never at all come to action.[11]

I have said that "credivity" or suggestibility is a normal psychological phenomenon, common to all of us and dominating daily life. There are, of course, bounds to normal suggestibility, although the normal is not sharply defined from the abnormal. Abnormally we see it in the hypersuggestibility of hysteria and hypnosis. In hypnosis therefore the normal suggestibility of an individual may be abnormally increased. Hence suggestion not accepted in the waking state (waking suggestion) may be accepted under hypnosis. In analyzing this greater suggestibility and

[11] This seems to echo the dictum of Cardinal Newman, who wrote in reference to faith however (Discussions and Arguments, Ed. 1888, p. 295), "Life is for action. If we insist on proofs for everything, we shall never come to action: to act you must assume, and that assumption is faith."

credulity in the hypnotic state, we must look at suggestion from still another point of view, namely, the mind's acceptance of an association of ideas by the inhibition of the rest of consciousness, or by the *dissociation* of the mind's bulk of associated ideas which it has accumulated during its life experience. From this viewpoint therefore we see that upon the inability to associate with one's entire mind rests the condition of suggestibility or the acceptance of ideas under inadequate conditions.

But why will the mind believe under such inadequate conditions? Here we come to the crux of our question—the phenomenon of dissociation, the careful consideration of which had best be preceded by a brief review of the psychological elements in the thought-process itself. A stimulus to a sensory end-organ produces a neural excitation which is transmitted by way of the centripetal nerves to the brain. The excitation in the cortex awakens a conscious process which we call perception or sensation. We perceive as long as the stimulus acts. Directly the stimulus is no more, directly the excitation ceases, perception ceases and the conscious state as such completely vanishes. Yet a trace of the physiological process remains behind as a permanent alteration of the cells excited, possibly an alteration in the disposition of the molecules or a metabolic generation of a kind of residuum. The cells are thereafter predisposed to the same excitation, and should such again come to them, this former "presentation" again becomes conscious.[12] This alteration in the cells, this residual something, is memory.

But different excitations may be transmitted to the brain at the same time (as of the smell, touch, or sight of a rose for instance) and be simultaneously registered in the cortex. Now, anatomically the ganglion cells of the brain are connected and interconnected by nerve filaments. And one might conceive of the "residuum" overflowing the cell out of all sides into numerous nerve fibres, and flowing farthest into such as were also vibrating from the other end at which a ganglion cell had also been excited, and in this way, by some means as yet unknown to us, establishing paths

[12] This latent "charge" or "potential" in the cell once excited has also been spoken of as the "unconscious presentation" which when excited again becomes *conscious*. See also next note.

of communication. These then are "predisposed" paths, avenues of least resistance when such excitement again suffuses the cell at either end. Now as the stimuli acting upon us are manifold, the excitation transmitted to the brain multiple and complex, the communications between ganglion cells are constantly legion. Therefore let any one cell (or, rather, group of cells, for in the brain it is not so simple) be stimulated, and hundreds of the cells near and far in the cortex will be consorted and set vibrating; a hundred memories become conscious. Hence, the association of ideas, the interconnected contents in consciousness.

Though hosts of cells are constantly operating in the stream of consciousness, the greater bulk of the cortical "residual" elements are inactive.[13] These elements, these slumbering ideas may be thought of as latent and potential in the brain, as in the suburbs and beyond the outskirts of our present thoughts, or as lying in far distant fields of memory. Yet there they are, our ideas of to-day, of yesterday, of many years ago, easily again awakened, easily again set pulsing, easily again drawn into the focus point of consciousness by a neural charge, coming down some narrow alley of association. Always is idea conjoined with idea, memory linked to associated memory. And in this way amid this multiplicity of unconscious and conscious presentations there exists a path-way system in the brain, and in the mental life an integral harmony.

And so we say that the mind is made up of a myriad of distinct ideas or memories affiliated into a concordance or unity. And this aggregate, this totality of memory-pictures stored in

[13] "Der ganze Reichtum von Erfahrung den wir als das Ich in uns tragen" writes Stadelmann, "ist latent; nur von Zeit zu Zeit tritt aus diesem Vorrat etwas heraus ins Bewustsein und dient uns zum Denken, zum Urteilen, zum Kritik üben."

Plato also makes mention of this phenomenon in his Dialogue of Theætetus, in which he says "Our soul (mind) is like an aviary, full of wild birds, flying all about the place, singly and in groups. You may possess them, but you have none in hand; and until you collect, comprehend and grasp your winged thoughts, you cannot be said to have them either." See also Th. Ziehen's "Das Gedächtnis," Berlin, 1908, p. 3–4, 28, and 30–31.

It may be kept in mind that the same is true of emotions as of ideas; the stream of consciousness at any moment is imbued with but a minute quantum of that slumbering within us. Alfred de Musset has expressed this in the familiar line "Et l'on songe à tout ce qu'on aime, sans le savoir."

the cortex is the Ego, or spiritual-I.[14] Or again, we may say, the Ego is composed of all the psychological experiences that the mind has gathered and recorded. It stands as criterion of all life values. Each new perception as it enters consciousness is "sized up" by it, to which as a new content it now becomes a part. (So also in the sense of Herbart's "Apperception-mass.")

Should a content or association-complex become separated from this aggregate-mass or Ego, we have a dissociation,[15] in contradistinction to association. Certain single contents may be dissociated from the Ego or larger association complexes, in which latter case the integrity of our mind life may be cleft and double personality result. To a certain extent it is a natural normal phenomenon, as we shall see presently; abnormally it exists in hysteria, which disease is characterized by its great proneness to dissociations. It appears abnormally in the hypnotic state also. Its study leads us through by-paths of scientific research into the borderland states of mental vivacity and vagaries of the mind and coaxes away from the fundamentals into the overtones of soul life. Here we happen upon the problems of penumbral moods, the tenuity of the subemotional, the realms of dreams, the interdreamed waking states and the somnambulistic, hallucinations, trances, the so-called subconscious or subliminal self and strange alterations in personality.[16]

Let us here take up some ordinary examples of dissociation

[14] "Meines geistigen Ichs, das heist, eine Gesamtvorstellung aller der Erinnerungsbilder welcher in meiner Hirnrinder vorhanden sind" (Ziehen). See also Ziehen's Leitfaden der Psych., etc., p. 213; also this author's "Erkentnistheorie" chapter 9, p. 40.

[15] We are speaking here of psychic and not organic dissociation. The organic, for instance, occurs in aphasia after apoplexy, etc., and in the psychoses "with defect." A psychic, functional dissociation, however, may also occur in the psychoses. See Ziehen's Psychiatrie, p. 82., Stadelmann's "Aerztlich-pädagogische Vorschule," chapter xix. See especially the interesting and instructive case quoted by Taine (De l'Intelligence, 3rd edition, vol. ii, note p. 461). Also, cited by James (Psychology, vol. i, p. 377).

[16] See Janet's "The Major Symptoms of Hysteria"; Sidis's "The Psychology of Suggestion"; F. W. H. Meyers's "Human Personality, etc." (edit. 1907); Morton Prince's "The Dissociation of a Personality"; Alfred Binet's "La Suggestibilité" and "Alterations in Personality" (1896); Raymond et Janet's "Les Obsessions et la Psychasthenie"; Waldstein's "The Subconscious Self"; E. v. Hartmann's "The Philosophy of the Unconscious"; Jastrow's "On the Trail of the Subconscious"; Sidis and Goodhart's "Multiple Personality"; Janet's "L'Automatisme psychologique," Paris, 1889; M.

in daily life: We cannot remember something, we cannot at the moment bring it into consciousness. Yet it is registered in our mind. At some other time "it will come to us." It is for the moment dissociated from the Ego. Should an idea however become dissociated and not again find its way back to the aggregate association mass, we have absolute forgetting. So, too, we see a face that is most familiar, but for the moment "cannot place it." In our mind then we go through the curious process of making these familiar features fit in somewhere, and finally succeed; or without thinking further of the person suddenly it occurs to us when and where we have seen the face before, *i.e.*, the gap in the association train has been spanned. This may happen even in the case of a person whom we know well. It has occurred to all of us that we have passed an acquaintance without recognition and that a few minutes after we remember and say, "why that was so-and-so!" We know now who it was (and strangely too, we recollect now that we passed someone whom we knew) but at the moment of passing the memory of the individual was dissociated. Let a boy be deeply engrossed in his dime novel and he neither hears nor sees what is going on about him. He is "dead to the world" we say. Save for the story in hand, all is dissociated from his consciousness. Impressions certainly do reach his brain through the ears and eyes and by way of tactile sense, but these are not attended, not apperceived, and so remain unassociated to the Ego. They may be registered reflexly (automatically) or they may not find anchorage and thus be forgotten.

Dessoir's "Das Doppel-Ich," Leipzig, 1896; Schrenck-Notzing's "Ueber Spaltung der Persönlichkeit," Wien, 1896. Binet, "On Double Consciousness" (Eng. Trans.), 1889; Ribot's "Les maladies de la personnalite"; Dana in "Psychol. Review, 1894, p. 570; MacNish's Philosophy of Sleep (1831); Azam "Les alterations de la personalité"; Revue Scientifique, 1883, 11, also his "Hypnotisme et double conscience, 1893; S. Weir Mitchell in The Transactions of the College of Phys. of Phila., March 4, 1888; Krafft-Ebing's "Hypnotische Experimente (Stuttgart, 1893). For "Dämmerzustande" see also W. R. Gower's "Borderline States of Epilepsy"; Raecke's "Die Transitorischen Bewustseinsstörungen der Epileptiker" (Halle 1903). For such conditions in connection with the child, Ziehen's "Die Geisteskrankheiten des Kindesalters," Zweites Heft, Berlin, 1904. See also in Oppenheim's Lehrbuch, under Hysteria. Also Griesinger and Krafft-Ebing's Psychiatrie. A series of very interesting cases are described by R. Henneberg in "Spiritismus und Geistesstörung," Berlin, 1902. See also Loewenfeld, "Ueber traumartige und verwandte Zustände, Zent. f. Nerv. u. Psychiatrie, Heft. 15 und 16, 1909.

Dissociation also occurs when we are tired or excited, at which time we may "forget ourselves" (associations of social etiquette, etc., become dissociated) or make "slips of the tongue" or "stick" in our speech. How often do we in this way lose the thread of the conversation, and becoming embarrassed, soliloquize "what was I saying!" The condition which we call "absent-mindedness" likewise belongs here. A curious dissociation also occurs in that condition in which we feel as if we have experienced a certain occurrence before, or when we have the strange sensation as if we were living some former experience over again. Here the occurrence is momentarily forgotten (dissociated) and at the next instant again perceived; it now appears familiar but is not associated in memory (Stadelmann). The time-span may appear long even if the dissociation was but momentary. This is a constant occurrence in dreams. (For another probably better interpretation see James, vol. i, p. 675–676.)

Stadelmann in a study of the nervous child in the school, called attention to the fact that the pathologically tired child may make numerous mistakes in writing and talking through psychic dissociation. The letters drop out of words (and even letters out of other dissociated words may be placed instead), words out of sentences, or an idea out of a train of thought, so that the writing or speech of such a child appears "full of mistakes." This of course is of great importance to the pedagogue, who is to distinguish here between the lazy or backward child that does not do its work well and the neurotic or hysterical. Such dissociation Stadelmann noticed as a frequent forerunner of epilepsy, and as an early sign of mental disintegration. ("Das Nervenkranke Kind in der Schule," *Montagsblatt der Magdeburgische Zeitung,* No. 22 and 23, 1906. Reprint from Faber, Magdeburg, 1907.)

Again, in a normal way, dissociation is a phenomenon in the process of mental evolution, for associations must be loosened and separated to allow other ideas to be linked in. In this way also, we "change our minds" or undergo a thorough upheavel or reconstruction of our beliefs, theories, etc. It is by dissociation too, that discrepancies occur in our memories of past events. Certain ideas drop out of the aggregate association mass and do not find their way back again. On the other hand imagined incidents

are interpolated. So it will be remembered that Goethe, writing his autobiography late in life, called it "Aus meinem Leben, Wahrheit und *Dichtung*," [17] knowing that his memory did not hold absolutely true, that imagination had colored events and filled in the interstices, that many an incident in his life had been

[17] The italics are mine. For an interesting commentary on this, see Goedeke's Preface, Stuttgart Edition, 1867, p. iii.

In this connection one may also note that mental condition of the "romantic phantasist" or dreamer who soars much and comes down to earth but little, so also that of the visionary who "sees things" (as for instance the poet Blake, Swedenborg, and Newman). To the kinship between the "artistic temperament" and hysteria Möbius has called attention. Here dissociation plays a more or less important part in proportion to the extent of the abnormality of such minds. It is analogous to the hysterical (especially so of hysterical children), in whom one finds varying degrees of abnormal fabulizing and pathological lying ("pseudologia phantastica," Delbrück), which is to be attributed to transformation of memory-images (though the hysterical also lies consciously often enough, in order to make himself appear interesting). Such individuals have a "hypertrophied imagination." After they have heard or seen a thing, for instance, or even while they are looking on or listening their imagination paints in additions or alters the entire. On reproducing the memory picture, the imagined portion is accepted as real and becomes actual for them. (The same is frequently true of children who are psychopathological by heredity.) Sometimes the "lie" is outright and entirely fantastic; sometimes there is an intermingling of truth and fiction. Of course there is no dissociation in the case of lying for a purpose (to help out a friend, to shield oneself, etc.) nor where in mentally abnormal or other children the perceptions are dulled or power of attention weakened, or where the sharp outline of the memory image is lacking. (So, for instance in the very young. See W. Preyer's Die Seele des Kindes, p. 234). There are many stages from the normal child with heightened imaginative faculty, who still knows where reality ends and phantasy begins, through the condition in which one "lies so well that one believes it oneself," or in the case of the child who "makes believe" so intensely that he gets frightened (at the make-believe bear or Indian, etc.) up to the condition in which the mind fabulizes and knows no more what is true or false, or becomes even a prey to its own phantasy. The entire subject is important not only from the viewpoint of the physician but from that of the pedagogue. For literature, see Oppenheim, Lehrbuch, vol. ii, pp. 1049, 1051; Ziehen, Psychiatrie, pp. 563, 587; Bruns, "Die Hysterie des Kindes," p. 27, 28, and especially Groos, Das Seelenleben des Kindes, Chap. XII; Strohmayer, Psychopathologie des Kindesalters, Tübingen, 1910, pp. 42, 43, 97–101; Delbrück, Die pathologische Lüge und die psychisch abnormen Schwindler, Stuttgart, 1891; Kemsies "Kinderlügen und Kinderaussagen," Zeit. f. paed. Psych. u. Path., vol. vii, viii, 1905, p. 183, etc.; Stanley Hall, Adolescence, vol. i, p. 349–353; Ribot's L'Imagination criatrice; Binswanger, Die Hysterie, Wien, 1904, s. 330–334.

"dreamed 'round" or even wholly "dreamed in." (So, for instance, that charming Sesenheim Idyll.)

Finally, sleep itself is dissociation (and what a mystery it has proved!) and in the dreams which come with sleep we have dissociation, for you all know how our wonted ethical, moral, and other associations here pale into forgetfulness and we enact the part of thief or pirate, murder in glee, or dally along a primrose path of rapine and outrage, all matter-of-fact and unconcerned. So again there may run a medley of utter absurdity through our minds,—a diffuse dissociation—a veritable jumbling up of memories and ideas.[18]

We have spoken of certain individuals being more suggestible than others. We may also say of these that their minds are more dissociable. An abnormal extreme of this I have already said we find in hysteria. Forel[19] has defined this condition as a

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[18] The subject of dreams is not only highly interesting in connection with our subject (for we have many dream and inter-dreamed trance states to deal with) but is important for the purpose of diagnosis and therapy ("dream therapy"). The following facts may therefore be noted: O. Vogt speaks of two types of dreams (*a*) the ordinary, entirely dissociated, diffuse dreams, and (*b*) the more circumscribed dreams of the somnambulist which correspond to a narrowing in of the field of consciousness. Here the neural energy is as it were dammed up in a particular circuit. There occurs in this state of partial waking in the midst of general sleep. In this active field the clearness and keenness of perception are intensified. In this somnambulistic state the ethical associations are usually (not always) maintained.

That even the most absurd dreams are only apparently so, and may be analyzed and rationally deciphered, and that dreams are even direct "keys" to the mysteries of subconscious cerebration is the theory of S. Freud. See "Die Traumdeutung," Leipzig, 1900, "Uber den Traum," 1901 (in Grenzfragen des nerven und Seelenlebens). See also Stekel's "Beiträge zur Traumdeutung," Jahrbuch Psychoanalytiche und Psychopath. Forsch., 1907, p. 458.

Perez holds that the influence of dreams extends to our sentiments and our morality. The mental states which are produced with or without consciousness during sleep are the consequence of and the preparation for certain states of our waking hours. He believes that according to the nature of the dreams which it has during the night a child is more of less cheerful during the day, more or less inclined to be good or obedient (The First Three Years of Childhood, Eng. Trans., 1894). Ch. Lévêque has written similarly "It is possible that the cheerful or sad humors of the day are a faint repetition of the agitations experienced in sleep, and that all the workings of the mind during the night may help to produce certain actions of the day (cited by B. Perez).

The most thorough volume on dreams is that of Sante de Sanctis, "I Sogni" Turino. 1899 (Germ. trans. by Schmidt, Halle, 1907). See also the

dissociative weakness of the brain which occasions a diseased auto-suggestibility with its tendency to functional disturbance of all sorts, etc. A similar exaggerated dissociability occurs in hypnosis. It is because of this that some (the Salpêtrière School) have called hypnosis an hysterical attack and claimed its occurrence only in the hysterical.[20] This however is surely not the case and is at present maintained only by certain followers of the Charcot tradition.

If it were true, then, as Forel has pointed out, some 95 or 96 per cent. of mortals (for so many are hypnotizable) are hysterical! Then too, a certain class of hysterical individuals, if these are to be accounted such, are not suggestible at all but strongly auto-suggestive. I have already spoken to you of and shown you these cases on several occasions, and have suggested for this class the name "wet-faced" or "moist-faced" type.[21] Such individuals

following: Tissié, "Les rêves," Paris, 1890; Kronthal, "Der Schlaf des Andern" Halle, 1907; Moll's Hypnosis, 4th ed., p. 180–195. There is an interesting note on the dreams aroused by organic sensations in Ribot's "The Diseases of Personality" (Chap. I) and also mention of dreams forgotten during the day and returning distinct in all details on the moment of falling asleep on the following night, etc. (Chap. III). Many literary tales have been built upon this fact and one has become rather famous and is among the finest short stories to be found in any language, namely, Th. Gautier's "La Morte Amoureuse." That dreams may be aroused by drugs should not be forgot. See De Quincey's "Confessions of an English Opium-eater," and Baudelaire's "Paradis artificiels," etc.

[19] Hypnotismus, 5th Edit., p. 150.

[20] Hirschlaff's brief summing up on this point is excellent. He says, "There is not the least doubt but that the superficial forms of hypnosis haven't the slightest, but absolutely not the slightest in common with hysteria. On the other hand deep somnambulism is in theoretical aspect related to hysteria inasmuch as both are probably due to the same fundamental neuro-psychic dissociation. . . . Yet the hypnotized is quiet and shows no spontaneous reactions; the hysterical in the usual attack shows spontaneous phenomena, clonic and tonic spasms, screaming, emotional outbreaks, etc." Hypnosis can also be induced in the non-hysterical alcoholic, etc., etc. See his book, p. 218–20. Also Forel, p. 151–2, and Loewenfeld (Der Hypnotismus, 1901) p. 85, et seq.

[21] In our clinical material these patients are strikingly similar. They have all been Poles, chiefly female, at or after puberty (I have seen no cases among children). They are almost always somewhat fleshy or slightly obese, their complexion ruddy, easily deepening to a flush, the arterioles in many cases seen to be dilated, the eyes wet, the entire face looking decidedly "moist," carrying an expression of painful self-sympathy. They cry easily and copiously. They also sweat profusely. They evidence every lack of energy.

can be hypnotized only with difficulty, if at all, and they prove refractory to every kind of treatment.

How is this extreme dissociability brought about in hypnosis? It is done by narrowing the range of consciousness. By having a subject concentrate his attention we eliminate all other impressions, exclude all other perceptions, and bring the brain's activity to a focus. This not only intensifies the perceptive activity in the contracted field of consciousness, but disengages it from the remaining association aggregate, which becomes relatively inactive, rests as it were, as the brain rests in sleep. It is dissociating special association complexes from the Ego, or speaking in different terms, it is inhibiting mental action. When we narrow the field of consciousness by concentrating the subject's attention we are inhibiting other fields of consciousness.

This does not occur in hypnosis alone; it will be remembered that hypnosis itself is brought about in the waking state. But normal cerebration, too, involves constant inhibition. To entertain an idea many other ideas must be suppressed. In fact in the process of thinking this inhibition is very necessary, otherwise our associations would commingle promiscuously and thought-confusion reign.

It is given into our hands therefore to force areas of the brain into activity and thus throw others into relative desuetude. This fortifies us with a strong psychic implement in our therapeutic armamentarium, for there occur in the act of cerebration two rather remarkable psychophysical effects, namely, *that in neural activity energy is discharged into motor or emotive action, unless such action be inhibited; and that such motor action or emotive effect inhibits the opposite or contrary issue.*

The comprehension of this is so significant for the actual

character and will power. They complain of being abjectly miserable, of having pains *all over*, usually of a "burning" nature. The pain "wanders about" and at night keeps them from sleeping. They may also complain of paræsthesias, but pain is the cardinal symptom. Objective examination has usually been negative. These patients are mostly of an ignorant type, and appear insensate to all advice, suggestion, or logical persuasion. Psycho-analyses and association tests have proved impossible. The psychalgia is almost uninfluencable by drug treatment. I have tried bromides, the coal-tar products and even large doses of codeine without effect. Nor has any other therapy seemed helpful in my hands.

manœuvring in the practice of psychotherapy that we must examine carefully the various elements in the psychological problem here involved. The elements in the complete neural charge and discharge occasioning a psychophysical process are excitation (external stimulus, afferent current, cortical reception) perception or sensation, association of ideas (or play of motives or deliberation), and finally action (or emotivity) or, *sensu stricto,* the resulting idea of motion precipitating the act, etc. (Ziehen). The neural afferent charge is therefore modified before it becomes efferently discharged. This modification occurs after the perception has worked in as an idea in association among the memory images left by former cortical excitations. It is milled as it were by the apperception mass and comes forth essentially altered. In this process another factor plays a very important rôle, namely, the positive or negative feeling or emotional tone (Ger., Gefühlston [22]). Not only is every perception accompanied by its emotional tone, but every memory has its pleasureable or displeasureable deposition, which is again actualized in the awakened memory.[23] These feelings are the motives to productivity. They become summated and discharged and so the impellents to action and deed. Every incoming nerve current to the perceptive centres therefore stirs up feeling, positive or negative, and in the association of ideas, in the engagement of motives there is a sort of battledoor and shuttlecock play —an associative grouping of memory images and sensations—and finally the positives or negatives (or neither) win; and this proves the *fiat* or *negat* upon which depends the discharge into the motor area and the consequent action. And herein also lies the secret of volition and *the psychology of will.*[24]

[22] There is no English equivalent for this word. It has been translated as "emotional tone," "affective tone," "tone of feeling," etc., all of which terms however lack the finer nuance of the German. Frequently the word "interest" is used to express the same thought (so in James's work).

[23] For reference on this subject see Ziehen's "Psychology," 7th Edit., Chapter IX; also that author's monograph on Memory, Berlin, 1908, p. 14; also H. Stadelmann's Aertzlich-pädagogische Vorschule, etc., Chapter IV.

[24] "Das Wollen bezeichnet auch eine seelische Situation, welche ausschliesslich durch ganz bestimmte Vorstellungen und Gefühlstöne gekennzeichnet ist." Ziehen, *loc. cit.*, p. 258, etc. "In dem Anstoss, den das zentralnervensystem von ausen her durch den Reiz erhalt, liegt schon im Keime der Impuls zur Ableitung den wir Wille genannt haben. . . . Wir müssen uns stets vor

Now let us momentarily return to the beginning of our former paragraph and schematize the neural process into three elements: (1) perception or sensation, (2) association of ideas or play of motives, and (3) action, etc. If we omit the first and third elements in this chain we have the psychical function of *thinking* (or reflection).[25] And yet this is but roughly true, for if we examine our problem carefully we find that the third element is really not entirely wanting in the process of thinking, and that in truth some energy is discharged into motor channels, and you will notice during this psychophysical activity that the forehead is furrowed, the jaw held somewhat firm, the lips moved or drawn tense, the neck musculature fitted in equipoise, and the entire body more or less "set." Again, thinking has been described as an abstinence from talking or acting,[26] in which conception is embraced the idea of a damming up of action (for talking is also action). In short, without piling up further citations, we may assume that every idea is suffused with a potential motor charge, or go even farther and say that more or less of the motor is actually always discharged.[27] Phylogenetically and ontogenetically, we may be reminded, motion and cognition go together, and so too in their areal projection on the cortex are topographically adjacent.[28]

Augen halten, das wir unter Wille eine Summe von Vorgängen zu verstehen haben und nicht eine selbständig und unabhängig wirkende Kraft." H. Stadelmann, *loc. cit.*, p. 72. See also an excellent exposition of this conception in H. Münsterberg's "Psychotherapy," p. 90. (Will is also so treated by Herbart, Bain, Spencer, etc. Wundt, on the other hand, has come to quite contrary conclusions.) It is very important to keep this conception of will in mind, for it answers many of the questions asked of the hypnotist concerning the subjugation of will under hypnosis, the possible weakening of the will, etc. Will is only strengthened in the hands of the trained psychotherapist, never weakened. This is the conclusion that every careful specialist on the subject has come to. Pertinent to this see Aschaffenburg's remark on p. 796 of H. Curschmann's large recent compilation of nervous diseases, Berlin, 1909. See also p. 377, et. seq., Loewenfeld's Hypnotismus, 1901.

[25] Th. Ziehen's "Leitfaden der phys. Psych., pp. 22, 212.

[26] A. Bain, The Emotions and the Will.

[27] Every impression which impinges on the incoming nerves produces some discharge down the outgoing ones, whether we be aware of it or not, etc. (James's "Psychology," vol. ii, p. 372). See also Ribot's "Psychol. of Attention," Chap. I, 2, and the following reference.

[28] M. Cohn, "Ueber das Denken," Berlin, 1910, p. 63, etc.

I have spoken of motion and emotion together. You will call to mind the existence of striped and unstriped muscle fibres, the voluntary and involuntary. Motivated action is associated with the former, the emotive (arteries, bladder, gastro-intestinal tract, etc.) chiefly with the latter. The latter too are especially the vegetative, automatic, unconscious processes. But both are intimately influenced and more or less swayed by cortical excitation. You know how one can often deduce the thoughts of an individual or the motives behind his thoughts by watching the action of his arteries and facial muscles (flushing, paling, stuttering, "expressions," etc.), and how because of this observance we say we "read people." Again, we are rather astonished when our thoughts are "read" as the muscular innervations which they occasion are accomplished unconsciously. Nor does this phenomenon occur only in the "mimic," though it is here that not only momentary thoughts are portrayed, but the larger bent of the soul-life is exquisitely graven and the lines of character indelibly etched in. It will be found, as Lange pointed out, that different thoughts, or rather optical memory-images will bring about unconscious movement in the eyes (think of the future and the eyes and lids are thrown somewhat upwards, think of the past, and the contrary occurs, etc.). Again, you know how the anal sphincter may contract in excitement, or the muscle fibres of the bladder, the latter causing constant micturition (as, for instance, in the case of the student awaiting an examination). Here too belong the unconscious rubbing of hands, wiggling of the fingers, tapping with the toes, picking at the nose, chewing the lips, scratching the head, being fidgety in general, and especially the incessant walking back and forth when agitated. (One may also attribute the agitation and great urgency to activity of the maniac to his "flight" of thoughts, and the slow movements, heaviness, inactivity, costiveness, and enuresis of the melancholic and hypochondriac to his slow state of mental activity.)

If we have said that the action may be inhibited, this does not imply that the excitation has not run into motor innervation. In such a case there may be a careful balancing of muscles giving

an equilibrium, an attitude, an attention,[29] or a general muscular "setting." Eventually therefore, the muscle is always at the end of the neural current,[30] and a motor element is the inevitable resultant in the arc of psychophysical activity.

As for the second effect referred to above, namely that motor action inhibits the opposite action, let us now word this somewhat differently and say that when the mind wills an action the opposite action is suppressed or inhibited. It appears that innervation simply blocks the motor path to the contrary innervation. You cannot inspire and expire or smile and frown at the same time, nor will to open and close the eyes simultaneously. To will the one necessitates the negation of the other. "There may be a wrangling between those two impulses," writes Münsterberg, "but as soon as my will stands for the one the other is really excluded. Any action which I am starting to do thus crowds out the impulse to the opposite action." How does this apply in the case of other than single ideas? Two separate ideas cannot be entertained at the same time, but simultaneous ideas blend into complex ideas. It is evident from this that the ideas must be closely associated and correlative. Only such ideas as "fit" into the same motor setting can merge and be thought of at the same time. We cannot ponder two themes at once. A content not harmonizing in the general motor poise, not congruent to the conceptual system is therefore dropped from the mind for the time being. You see of what great practical importance this phenomenon is to us as psychotherapists, for in wishing to banish a distressing train of thoughts or expel depression, we have but to suggest the opposed mental trend and we do so not only by constant and reiterated

[29] The word attention is from the Latin "tendo," to stretch or strain; hence also our word "tension." Muscular "strain" is implied in the word, and such muscular strain or tension is always noticed when we "strain our attention," or "attend closely." This feeling is also present when we strive not to wink, not to smile, or "try to recollect," etc. The sensation eminates partly from tension in the tympanic membrane and the muscles used in accommodation and convergence, the frontalis, etc. See also James, *loc. cit.*, vol. i, p. 300–301, and Duchenne, cited by Ribot, *loc. cit.*, I, 2.

[30] It has even been held (J. Gerlach) that the muscle was nothing else but an expansion of the nerve. (See Cohn, *loc. cit.*, p. 68, etc.)

suggestion but by adding associations and thus strengthening the new premise.[31]

I have not dwelt upon the subject of attention, for it would take too long to discuss this important chapter in psychology. But what I have said of thinking applies here too, for attention is no more than a matter of ideation,—sensations or ideas are the motives occasioning attention, because they happen to be in the field at that moment by way of association, or because they are brought into focus by vividness, intensity, etc.,—and involves nothing *ultra* to the neural (psychophysical) process familiar to us.[32] When we will to attend a thing, it is willed here precisely

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[31] In cases of depression and melancholy hypnotic treatment proves most beneficial. I have seen several cases, which had been treated in very many ways and over a period of several years without success, begin to improve almost immediately under hypnotherapy. One endeavors in these cases to awaken positive emotional tones, a task not easily accomplished in the waking state, as such patients remember nothing pleasant, all happenings with which positive affective tones are connected seem to have dropped out of their memories. With the awakening of such positive feeling one also awakens hope in the patient, who having thought that he could never more experience joy, now begins to believe that probably after all he may be cured. This very hopefulness is the beginning of and the greatest adjuvant to his recovery.

In this connection it may also be pointed out that children unconsciously make use of the same phenomenon when they think of sexual things in order to banish fear at night. Inquiry into the causes and continuance of masturbation in young children and adults, has led me to believe that one, if not the chief reason, of continuance of this habit lies in the fact that the sexual being the very strongest of emotional tendencies, is brought into mind to crowd out the "being afraid" which especially nervous children and adults experience when alone in a room at night, or in the dark. Such thoughts are also used to dispel other worrying or distressing ideas in older people. In the treatment of manual or mental masturbation therefore, this should always be kept in mind.

Immanuel Kant in that now famous little volume "Von der Macht des Gemüts," also wrote how he was able to conquer his insomnia caused by severe spasms of pain, evidently due to gout, by bringing some other thought into his mind (not by expelling all thoughts—"thinking of nothing") and riveting his attention upon it—as for instance upon the name Cicero which evoked innumerable associations in his mind. Very soon the pain was forgotten and he would fall asleep (p. 26).

[32] "Apperception ist Eintritt einer Vorstellung in den Blickpunkt des Bewusstseins. Apperception und Aufmerksamkeit sind dasselbe." J. Baumann, "Wille und Charakter," etc., Berlin, 1905, p. 26.

We cannot attend as we *will*, just as we cannot think as we *will*, but *must* think or attend just as those ideas which happen to be present enjoin. Both

as in the matter of ideas already spoken of, and here too the emotional tone (or interest) is an all-important factor. In "attending," the ideational neural charge is conducted into the muscles giving their "setting." And, again, our span of attention is on the whole limited to a harmonizing conceptual system, to associative or correlative ideas. We can however oscillate rapidly between two or more systems and thus in a way attend to more than a single thing;[33] but here the intensity of the one must not be greater than that of the other, for intensity in one direction means fading of attention in the other; so, for example, one cannot attend a toothache with intensity and follow a play at the same time.[34]

In the limelight of our attention, however, hundreds of conscious contents may enter and thousands of sensory stimuli be perceived[35] if they do not disturb the harmony of the associations, or militate against the motor attitude in which we have been "set." Of course those impressions which would lead to contrary motor innervation are here out of the question, their portal and

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attention and thinking are dominated by the momentary associative grouping of ideas and hence our volition is not in reality free, but only appears to be so. See Ziehen, Psychology, *loc. cit.*, pp. 212, 235, 202–4. Münsterberg's Die Willens handlung, Freiburg, 1888. See also note 24.

[33] It appears that with practice (which doubtlessly involves the automatic) one can learn to attend to two or even three conceptual systems at the same time, as the experiments of M. Paulhan showed, Revue Scientifique, vol. 39, p. 684 (quoted by James). Senator Depew also used to tell of a telegrapher he knew, who, could take and send a message at the same time, or even receive several messages while ticking off another. Whether this was absolutely true or only one of the Senator's remarkable stories, I am not prepared to say. A similar tale is told of Cæsar dictating four letters while writing a fifth! Here undoubtedly the process is one of rapid oscillation. See also Wundt's Psychology, p. 235–9, and Cattell's Experiments, Phil. Studien, vol. iii.

[34] Vice Versa, a play may make you forget about the tooth or other ache. So soldiers in battle often do not perceive that they have been wounded. See also Forel's "Hygiene der Nerven und des geistes," Stuttgart, 1905, p. 28–29. "Je intensive ich an etwas denke oder auf etwas achte, desto eingeengte ist das Feld meines Bewusstsein, etc." See however on this point James's "Psychology" (one-vol. edit.), p. 217.

[35] For an excellent description of the highly diversified and complicated mass of more or less conscious processes of the psychical life at any moment, as for instance, when at the theatre we see the performance of a play, see F. Paulsen's Introduction to Philosophy, Eng. translation by Thilly, pp. 125–126.

Fig. 1.

Woman in deep hypnosis.

FIG. 2.

Mild hypnosis.

path to discharge being shut. "To close the path," again to quote Münsterberg,[36] "means to inhibit the idea which demands such action. . . . We can look at the opera, see every singer and every singer's gown, can listen to every word, can have the whole plot in mind, can hear the thousands of tones which come from the orchestra; and yet combine all that in one act of attention, because it all belongs to the same setting of our reactive apparatus. Whatever the one wants is wanted by the others. But if at the same time our neighbor speaks to us, we do not notice it; his words work as a stimulus which demands an entirely different motor setting as answer. Therefore, the words remain unvivid and unnoticed. . . . Every act of attention becomes, therefore, a complex distribution in the reinforcement and inhibition of mental states."

Here we may pause and succinctly review the facts we have endeavored to define and analyze. Hypnotic sleep supervenes upon the suggestion of such in the waking state, by engaging the attention intensely ("expectant attention," belief in the power, skill to impress, technic of influencing sensation by voice, touch, etc., knowledge of and ability to influence the mind's associative dynamics[37]), and thus inhibiting all else not intimately associated (narrowing the field of consciousness), so producing dissociation (inactivating the aggregate memory mass or Ego). The subject now not being able to associate with his entire mental experience, is highly suggestible and *believes almost reflexly*. Ideation precipitates motor or emotive innervation unless such be inhibited by

[36] Psychotherapy.

[37] "In the proper application of such inhibition and reënforcement lies the skill of the hypnotist, in the after-effects of such influence upon future association of ideas the nature of post-hypnotic accomplishment" (O. Vogt).

It should not for a moment be lost out of mind that the technic of psychotherapy and of hypnosis especially, must be learned just as that of surgery, for instance, and that it is difficult and necessitates considerable practice and close application. The idea apparently in the minds of many of the students that they could go forth and just hypnotize a patient and "make him do things" is absurd. Even for waking suggestion as practised by the psychotherapist so thorough a knowledge of technic and psychology and much else is necessary, that Loewenfeld, writing in the Münchener medizinische Wochenschrift of Jan. 18, 1910, p. 121, says, "dass dieselbe den Anforderungen der Praxis gegenüber ganz und gar unzulänglich ist und zu folgenschweren Missgriffen führen kann."

other ideas. In the waking state such ideation is check-mated if found to be false by the criterion Ego; but in hypnosis the Ego, being dissociated, can no longer inhibit the false idea (or where the Ego is not entirely inhibited, and such is the case in a very large number of subjects, the intensity of attention to the suggested thoughts enervates and makes less vivid all other ideas, thus blocking their path of motor action), the subject has lost the power to conjure up inhibitant or inhibiting ideas (his inhibiting ideas are inhibited [38]), hence reacts upon the suggestion.

It will therefore be evident how under hypnosis one may bring a functionally paralyzed limb to contraction (or where in the paralysis of organic nature a functional quota is contained, which is frequently the case, or when there is still some potential innervation left, lessen the paralysis by producing some contraction) or, allaying a functional contraction, how psychalgias may be made to disappear, or real pain be entirely neutralized by withdrawing attention to other parts.[39]

Let me take this little patient who has been sleeping all this while. Possibly you think he has really fallen asleep. I pick him up. You see he does not mind it. I might pass him around to you and have you look at him like a specimen and again return him to me. He would not know of it, nor would it inconvenience him in the least. Yet this is too valuable a "specimen" should he be dropped or upset! So I'll place him here upon the table. If I whisper to him, he answers. He is therefore not asleep. Now I shall show him this colored square (red) and tell him I shall show him green. You see he answers green. I hold my fingers before his eyes and say he shall see nothing. He opens his eyes—and he sees nothing.[40] I place something into his hand and tell him it is something he has never seen before (it is a

[38] The credit of pointing out these inhibiting processes in hypnosis belongs to Heidenhain. See also Moll, p. 274, also Münsterberg, who believes the characteristic of the suggested concept to lie in its inhibiting the contrary or opposite of such concept.

[39] See also Ziehen's "Psychotherapie," III, p. 681, in Eulenburg and Samuel's larger work, *loc. cit.;* also Oppenheim, Lehrbuch, 4th Edit., p. 1102, for the same in the waking state.

[40] This is a negative hallucination. I cannot go into the interpretation of this phenomenon here. Like rapport and post-hypnotic suggestion, it has not as yet been satisfactorily explained.

FIG. 3.

Child in deep hypnosis. Showing absolute relaxation under hypnosis of a highly irritable and nervous child. The boy was brought to the clinic because of truancy and his constant wandering from home (Wandertrieb).

common lead-pencil) I ask him to feel it carefully. Now, what is it? He answers, "I do not know." He even looks at it, but doesn't recognize it.

I take this second patient; he sits quite limp in his chair; all tonus seems to have left his body. I take both his hands and paste them to his head. I shall ask the Doctor here to pull the arms away. He cannot do it until I give the word, and now they fall away quite limp again. Or I take this young boy, he is a patient I have not seen before to-day. He came because of a headache (examination proved negative). I tell him his headache will be gone on awaking. But now I also paste his hands to his head and you see I can lift him by the arms from his chair; he is in a state of catalepsy. I take the hands away, I awake him; his headache is gone.

But especially is it possible under hypnosis to bring out an emotional tone, to conjure up a memory that is pleasureable and thus captivate a positive or pleasureable tonal feeling. This is a great help in the treatment of melancholy and depressed states (and the neurasthenic is nearly always depressed) and it is very important in the education or re-education of patients whose "psychology" works wrongly. From the very start one makes such patients "feel better." Many tell me that "it feels as if a load has been lifted." I give them a good prognosis and they straightway begin to fulfil it. That little girl with a smile on her face, although her face seems set, I am treating with dreams of happy play, of butterflies and sunshine. She is here not because she is ill, but because she is sullen, morose, cross, and unmanageable at home. She was constantly getting worse and it was feared that she was mentally deteriorating. The greatest difficulty lay in coaxing her to take treatment. I finally succeeded in putting her asleep and began awaking dreams under hypnosis ("dream therapy") dreams which might create pleasureable interest, and thus kindle a little light in her gloomy soul. I have been treating her for a month, and the nurse tells me that she notices a striking change. The child has lost her dejectedness and smiles. You see her associations have been switched into different channels: she is being "psychically re-educated."

Finally it cannot have escaped your notice, that this very

state of absolute inactivity, this condition simulating sleep, may itself be of considerable service to us therapeutically. This induced quiescence calms the wrought up, irritated, "hyper-reflexive" patient, quiets his nerves, and acts as a sedative. But it can also act as a narcotic, and so the confirmed insomniac may receive the rest otherwise denied him. So, too, the sorely afflicted patient with general athetosis, and the choreic may be relieved, for you have seen how their movements cease almost entirely while asleep. (Cases are shown.) For such purposes, therefore, we keep the patient under hypnosis for two or three hours, or even longer. Wetterstrand, who was the first to proceed in this fashion, let his patients sleep for days or even weeks (allowing a few brief waking states daily in order to give food, etc.) and thus instituted an absolute "rest-treatment."

Curiously enough, if left to himself, the hypnotized individual falls into a state in which focal concentration ceases, and a condition of general dissociation or disaggregation supervenes. Now the associations are all not severed but apparently loosened. The attention is, as James has said, "dispersed"; the subject though conscious, thinks really of nothing, and mental activity is at a low ebb. Though some subjects soon awaken, if not suggestively treated, others may be kept in this condition for a long period, or through suggestion be led into normal sleep, or of their own accord fall into such. This condition may alter some, and be very similar to that between wake and sleep, when we easily fall into dreaming and yet know we are dreaming, even seem able to lead or swell our fancies or change them. It is a state in which there easily pop into mind bygone odds and ends, memory-images of erstwhile scenes, long past and since forgotten. It is therefore in these interludes that psycho-analyses are most propitiously made or so-called subconscious affective complexes searched for.

It would appear that our duty had been but poorly performed, if, in bringing this psychological study to a close, we had not attempted some interpretation of the phenomenon of hypnosis along physiological lines and from the vantage ground of the physiological psychologist. Just here however most endeavors have miscarried, and though the theories advanced are numerous and engaging, they have led to few tenable conclusions. It would scarcely be

FIG. 4.

Deep hypnosis in girl.

FIG. 5.

Dreams being awakened in children under mild hypnosis. So-called "dream therapy."

of much avail to go into these theories at length, and I shall therefore only touch upon the more important ones and epitomize these, together with such aiding facts as I have been able to find in the literature on this and allied subjects, in the following.

In having the patient concentrate his attention—narrowing the field of consciousness—we cause a small portion of his cortex to be overactive, the larger part inactive. This overactive area is more intensely excitable, more intensely reactionable; it is plethoric, the remaining cortex relatively anæmic (which should also be the case in sleep). According to Vogt (and this theory is held to be the most plausible by Forel), the active neural element, the energizing power, working in the nervous system, which he calls "neurokyme," (*i.e.,* nerve wave) accumulates in non-active areas and is discharged into active areas. Whenever a centre becomes more active for some reason or other, the neurokyme elements from other centres are switched into it. Thus inhibition of the less active areas is produced. This inhibition is also of nutritive nature, metabolism being lessened here and increased in the active centre. Likewise also there is an increased blood flow to the latter, a decreased flow in the former. In the explanation of sleep (be this the ordinary or the hypnotic) he assumes the existence of certain subcortical reflex sleep centres. Such a centre is that for the closing of the orbicularis oculi, which in turn stimulates a vasomotor centre, causing increasing brain-anæmia and so sleep. These centres however may be stimulated through associations, as of the sleeping room, the undressing, etc., or even the remembrance of former sleep. Suggestion will do the same, and hence the rapid sleep upon suggestion.

A similar neural element is assumed by Wundt, who speaks of it as the "neurodynamic flow." In his theory there is a like compensation of energy; that accumulating in inhibited areas being conducted into and concentrated in active areas. There is also a secondary vasomotor compensation. As a result of inhibition the capillaries are contracted, while in the active region they are dilated. To this increased blood supply is again due the increased activity of this region. (On account of this concentrated power in the active area, we have in hypnosis the clearer discrimination, the strikingly exact recognition, etc., etc.) Wundt, however, also assumes an in-

hibition of activity in the regions connected with the processes of volition and apperception, postulating an hypothetical apperception centre which he localizes in the frontal lobes of the brain. This psychical faculty has been rejected as an entirely metaphysical assumption. (See Ziehen's Leitf. der phys. Psychol., 7th edit., p. 202–204; also Moll, *loc. cit.*, p. 287.) As for this frontal localization, modern brain physiology does not substantiate it. (See especially Grosglik, " Arch. f. anat. und phys. physiol., Abb.," 1895, and other literature cited by Ziehen, p. 203.)

Not very different from the above compensatory and vaso-motor theory is that of Cappie (so also, fundamentally, the idea of Brown-Séquard, Fechner, etc.). Braid and Carpenter, and in a manner Hack Tuke, also thought the brain to be in an anæmic condition during hypnosis (so also Heidenhain at first), and Mosso believed he had proved it by his experiments. On the other hand there were those who held to a cortical hyperæmia during hypnosis (so Salvioli, Bouchut, Czerny, Pick, Lange). Cappie thought there might be a plethora in the motor region and anæmia elsewhere. Later Brodmann of Berlin had occasion to make observations on a trephined subject and found that no constant changes in the brain circulation took place; he concluded that the change in the cortical blood supply could not alone account for nor be even reckoned as a constant concomitant of either sleep or hypnosis. Nor did the ophthalmoscopic examinations of Förster and Moll show any difference in the retinal arteries (which usually give the same changes as those of the cortex) during hypnosis. Again Heidenhain was able to induce hypnosis in spite of the subject having inhaled amyl nitrite, thus surely having dilated cortical vessels. Then, too, whether there exist hypæmia or hyperæmia, how can we say whether either is cause or affect? Finally, Kronthal (Der Schlaf des Andern, Halle 1907) worked out a theory in which sleep had no connection whatsoever with the cortex, but was a passing condition of all living matter in which most reflexes are weakened or disappear. The psyche is the sum of all reflexes, etc. He alludes to the well-known dog of Goltz which was kept alive for one and a half years after having almost the entire brain extirpated, and this dog slept (save for briefer periods of sleep and wakefulness) just like normal dogs.

Parallel with the vaso-compensation in the above theories goes

that of hypo- and hyper-metabolism (see Stadelmann, p. 93). In the waking state the cells are reactionally at their height. While they are receiving stimulation, metabolism is increased. These cells are producing, "using themselves up." This is called *dissimilation* (catabolism). Thereupon follows a period in which the cell recuperates, works less, and "builds up." This is called *assimilation* (anabolism). In reality both processes are constantly going on. In hypnosis dissimilation is at its height in the active area and at its ebb elsewhere in the brain. In the inactive areas assimilation is increased. In this connection may also be mentioned the theory of "activity and inactivity" of living material (in contradistinction to the physiologist's "work and rest") of Ademkewitz. When the brain cells are working actively we have consciousness while when working inactively we get the states seen in visions, dreams, subconsciousness, etc. (see his "Die Grosshirnrinde als Organ der Seele," Wiesbaden, 1902, Chapter 3).

Another theory (Van de Lanoitte, Pupin) rests upon histological grounds, following the discovery of Golgi and Ramon y Cajal, viz., that the end twigs of a neuron are not continuous with, but contiguous to, the next cell (interlacing with its dendrites). A loosening or dissolving of this contiguity would inhibit or break the conductivity of the neural flow. The actual mechanism of this could be accounted for through the amœboid movements of the dendrites (acting as pseudopodia)—which phenomenon would easily explain sleep, hypnosis and other psychic conditions. The amœboid action of the dendrites possibly worked like the positive and negative chemiotaxis of leucocytes. Thus one could also explain the effects of alcohol or coffee (causing the dendrites to spread out and make a strong contact) and other drugs, as morphine, upon the nervous system. (See Rabl-Burckhardt, "Sind die Ganglionzellen amöboid?" *Neurol. Zentral.*, 1890, No. 7; also, Duval, *Revue Scientif.*, 1895; Pupin, "La Neurone," *Thése de Paris,* 1896, etc., etc.). Ramon y Cajal even holds that on heightened functional activity, etc., new dendrites may thus be sent out and so form new collaterals. (See Ramon y Cajal, Allg. Betrachtung über d. Morphol. d. Nervenzellen., *Arch. f. Anat.*, 1896, Chap. 3–4.) Bechterew (speaking of metabolism of the cell) believes that strong stimulation will quickly tire the cell and bring it and its dendrites to contraction.

thus occasioning the inhibition we see in such cases. Ramon y Cajal holds that such contraction also occurs in the glia-cells, which cells form the contact between ganglion cells, and through contraction, break such conduction. The contraction is brought about by substances extruded from the ganglion cells during their activity (see W. v. Bechterew's " Psyche und Leben," 1908, Chapter xxx).

This highly interesting theory would be extremely convenient in the explanation of many psychic states. It has not been accepted however, because of its being too fanciful to be consistently applied to mental activity in which the simplest process involves not one but many groups of ganglion cells working coördinately together. One could scarcely conceive of the millions of cortical cells in constant motile activity, the dendrites intra- and extra-lacing—as would be expected in the thousandfold play of thoughts —the whole cortex in fact a moving mass (see Hirschlaff, *loc. cit.,* p. 227). Besides, the very foundation upon which the above neuron theory rests has been shaken by the studies of Held, Dogiel, Apáthy, Bethe, and Nissl, who showed that the real elements of the ganglion cells were neurofibrils which traverse both cell and axon and continue on through the next cell, thus forming a continuous neural system (facts already claimed by earlier observers). Bethe even demonstrated (in the crawfish) the possibility of reflex action in the nerve without its ganglion cell, while Nissl described such fibrillary elements as originating outside of the ganglion cell, the so-called " nervous gray " in which both dendrites and axons end, and which may form an intermediary between the axis cylinder of one neuron and the cell of another. Upon this subject (and adverse to the neuron theory) a large literature has sprung up, while on the other hand more recent writers have again begun to question the fibrillary theory (Lenhoesék, Hoche, Schmaus-Saki, etc.). The subject therefore still remains a somewhat mooted one. Finally and in connection with the above, we may mention, without going into detail, Schleich's theory based upon the neurolgia as the inhibiting medium, and Preyer's theory, namely that fixed attention causes an accumulation of waste products which induce the loss of activity in the remaining cortex.

And now after reviewing a considerable body of psychological and psychophysiological literature as well as the data of the neurologists and the books on hypnosis, etc., and after considering

this material and sifting pertinent occurrences in daily life, we have arrived at the end of our study and must ask "Have we interpreted our subject? Has Hypnosis been explained?" Far from it. And yet we have come to a better understanding of the phenomena involved by defining the words of our definition, by dispelling the mysterious and preternatural by instancing analogies in normal mental life, thus dismissing fanciful and mysterious hypotheses and levelling our facts along the highways and byways of psychology. Certain chapters of the subject we have avoided entirely, as their discussion would have carried us very far afield and would have ended in no satisfactory solution (such as rapport, amnesia, negative hallucinations, etc.). We have seen that on the whole the physiological theories have left us in the lurch, while on the other hand where psychological hypotheses have been drawn upon (as in the case of Wundt's apperception centre) they themselves have not been acceptable and have therefore made the subject no simpler. How can we account for the rapidity of effect, the mere phrase causing an inhibition or again revoking it? How can we explain the almost instantaneous production of dissociation? I say "sleep" to the patient with whom I am *en rapport* and his entire psychic condition is altered. I say "awake" and the somnambulistic state fades—into the forgotten! How, asks Hirschlaff, can we interpret the suggested hallucination which is evoked with a word, fleetly changed, or annulled? Neither blood-flow nor neurodynamic waves suffice to explain the enigma, nor any theory based on fatigue products. Far less can we throw light upon the phenomena of negative hallucination and amnesia. This of course does not mean that we should plunge into the metaphysical nor stumble over our shortcomings into the spiritualistic. This as scientists we decry and entirely eschew. The fact is, our science has not as yet advanced far enough to entirely clear up the heart of this as of many another mystery—sleep for instance, or hysteria. And therefore we may bear Wundt's advice in mind, here at the end of our analytical survey, that we need no new forces beyond the physiological and psychological to interpret the phenomena of hypnosis, amazing as they may at first appear, only the laws of the mechanics of the nervous system and the mind are not even yet sufficiently known to suffice for the comprehension of the waking state.